THE NEUROPHONE

The Neurophone is an electronic device which literally enables one to 'hear' through the skin.

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In the early 1960s, while only a teenager, Life *magazine listed Patrick Flanagan as one of the top scientists in the world. Among his many inventions was a device he called the Neurophone—an electronic instrument that can successfully programme suggestions directly through contact with the skin. When he attempted to patent the device, the government demanded that he prove it worked. When he did, the NSA (National Security Agency) confiscated the Neurophone. It took Pat years of legal battle to get his invention back.*

HISTORY OF THE NEUROPHONE

The first Neurophone was made when I was 14 years old, in 1958. A description was published in our first book, *Pyramid Power*. The first Neurophone device was constructed by attaching two Brillo pads to insulated copper wires. Brillo pads are copper wire scouring pads used to clean pots and pans. They are about two inches in diameter. The Brillo pads were inserted into plastic bags that acted as insulators to prevent electric shock when applied to the head.

The wires from the Brillo pads were connected to a reversed audio output transformer that was attached to a hi-fi amplifier. The output voltage of the audio transformer was about 1,500 volts peak-to-peak. When the insulated pads were placed on the temples next to the eyes and the amplifier was driven by speech or music, you could 'hear' the resulting sound inside your head. The perceived sound quality was very poor, highly distorted and very weak.

I observed that during certain sound peaks in the audio driving signal, the sound perceived in the head was very clear and very loud. When the signal was observed on an oscilloscope while listening to the sound, the signal was perceived as being loudest and clearest when the amplifier was over-driven and square waves were generated. At the same time, the transformer would ring or oscillate with a dampened wave form at frequencies of 40-50 kHz.

The next Neurophone consisted of a variable frequency vacuum tube oscillator that was amplitude-modulated. This output signal was then fed into a high frequency transformer that was flat in frequency response in the 20-100 kHz range. The electrodes were placed on the head and the oscillator was tuned so that maximum resonance was obtained using the human body as part of the tank circuit. Later models had a feedback mechanism that automatically adjusted the frequency for resonance. We found that the dielectric constant of human skin is highly variable. In order to achieve maximum transfer of energy, the unit had to be retuned to resonance in order to match the 'dynamic dielectric response' of the body of the listener.

The 2,000 volt peak-to-peak amplitude-modulated carrier wave was then connected to the body by means of two-inch diameter electrode discs that were insulated by means of mylar films of different thicknesses. The Neurophone is really a scalar wave device since the out-of-phase signals from the electrodes mix in the non-linear complexities of the skin dielectric. The signals from each capacitor electrode are 180 degrees out of phase. Each signal is transmitted into the complex dielectric of the body where phase cancellation takes place. The net result is a scalar vector. Of course I did not know this when I first developed the Neurophone. This knowledge came much later when we learned that the human nervous system is especially sensitive to scalar signals.

The high frequency amplitude-modulated Neurophone had excellent sound clarity. The perceived signal was very clearly perceived as if it were coming from within the head. We established quite early that some totally nerve-deaf people could hear with the device. For some reason, however, not all nerve-deaf people hear with it the first time.

We were able to stimulate visual phenomena when the electrodes were placed over the occipital region of the brain. The possibilities of Neurophonic visual stimulation suggest

that we may someday be able to use the human brain as a VGA monitor!

I wrote my own patent application with the help of a friend and patent attorney from Shell Oil Company and submitted the application to the patent office.

When I was 15 years old, I gave a lecture at the Houston Amateur Radio Club, during which we demonstrated the Neurophone to the audience. The next day we were contacted by a reporter from the *Houston Post* newspaper. He said that he had a relative who was nerve-deaf from spinal meningitis and asked if we might try the Neurophone on his relative. The test was a success. The day after that, an article on the Neurophone as a potential hearing aid for the deaf appeared and went out on the international wire services.

The publicity grew over the next two years. In 1961, *Life* magazine came to our house and lived with us for over a week. They took thousands of photographs and followed me around from dawn to dusk. The article appeared in the 14 September 1962 issue. After that, I was invited to appear on the *I've Got a Secret* show hosted by Gary Moore. The show was telecast from the NBC studios in New York. During the show, I placed electrodes from the Neurophone on the lower back of Bess Meyerson while the panel tried to guess what I was doing to her. She was able to 'hear' a poem that was being played through the Neurophone electrodes. The poem was recorded by Andy Griffith, another guest on the show. Since the signal from the Neurophone was only perceived by Bess Meyerson, the panel could not guess what I was doing to her.

As a result of the *Life* magazine article and the exposure on the Gary Moore Show, we received over a million letters about the Neurophone.

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The patent office started giving us problems. The examiner said that the device could not possibly work, and refused to issue the patent for over twelve years. The patent was finally issued after my patent lawyer and I took a working model of the Neurophone to the patent office. This was an unusual move since inventors rarely bring their inventions to the patent examiner. The examiner said that he would allow the patent to issue if we could make a deaf employee of the patent office hear with the device. To our relief, the employee was able to hear with it and, for the first time in the history of the patent office, the Neurophone file was reopened and the patent was allowed to issue.

After the Gary Moore Show, a research company known as Huyck Corporation became interested in the Neurophone. I believed in their sincerity and allowed Huyck to research my invention. They hired me as a consultant in the summer months. Huyck was owned by a very large and powerful Dutch paper company with offices all over the world.

At Huyck I met two friends who were close to me for many years, Dr Henri Marie Coanda, the father of fluid dynamics, and G. Harry Stine, scientist and author. Harry Stine wrote the book, *The Silicon Gods* (published by Bantam), which is about the potential of the Neurophone as a brain/computer interface.

Huyck Corporation was able to confirm the efficacy of the Neurophone but eventually dropped the project because of our problems with the patent office.

The next stage of Neurophone research began when I went to work for Tufts University as a research scientist. In conjunction with a Boston-based corporation, we were involved in a project to develop a language between man and dolphin. Our contracts were from the US Naval Ordnance Test Station out of China Lake, California. The senior scientist on the project was my close friend and business partner Dr Dwight Wayne Batteau, Professor of Physics and Mechanical Engineering at Harvard and Tufts.

In the Dolphin Project we developed the basis for many potential new technologies. We were able to ascertain the encoding mechanism used by the human brain to decode speech intelligence patterns, and were also able to decode the mechanism used by the brain to locate sound sources in 3-D space. The brain acts like a Whitehouse correlator. These discoveries led to the development of a 3-D holographic sound system that could place sounds in any location in space as perceived by the listener.

We also developed a Man-Dolphin language translator. The Man-Dolphin translator was able to decode human speech so that complex dolphin whistles were generated. When dolphins whistled, the loudspeaker on the translator would output human speech sounds. We developed a joint language between ourselves and our two dolphins. The dolphins were located in the lagoon of a small island off of Oahu, Hawaii. We had offices at Sea Life Park and Boston. We commuted from Boston to Hawaii to test out our various electronic gadgets.

We recorded dolphins and whales in the open sea and were able to accurately identify the locations of various marine mammals by 3-D sound-localisation algorithms similar to those used by the brain to localise sound in space.

The brain is able to detect phase differences of 2 microseconds. We were able to confirm this at Tufts University. The pinnae or outer ear is a 'phase-encoding' array that generates a time-ratio code that is used by the brain to localise the source of sounds in 3-D space. The localisation time ratios are run from two microseconds to several milliseconds. A person with one ear can localise sound sources (non-linear) to a 5 degree angle of accuracy anywhere in space. You can test this by closing your eyes while having a friend jingle keys in space around your head. With you eyes closed you can follow the keys and point to them very accurately. Try to visualise where the keys are in relation to your head. With a little practice, you can accurately point directly at the keys with your eyes closed. If you try to localise a sine wave, the experiment will not work. The signal must be non-linear in character. You can localise the sine wave if the speaker has a non-linearity or distortion in the output wave form. A sine wave cannot be localised because phase differences in a sine wave are very hard to detect. The brain will focus on the distortion and use it to measure time ratios. Clicks or pulses are very easy to localise.

If you distort your pinnae by bending the outer ears out of shape, your ability to localise the sound source is destroyed. The so-called cocktail party effect is the ability to localise voices in a noisy party. This is due to the brain's ability to detect phase differences and then pay attention to localised areas in 3-D space. A favourite 'intelligence' trick is to have sensitive conversations in 'hard rooms' with wooden walls and floors. A microphone 'bug' will pick up all the echoes and this will scramble the voice. Almost all embassies contain 'hard rooms' for sensitive conversations. If you put a microphone in the room with a duplicate of the human pinnae on top of it, you will be able to localise the speakers and tune out the echoes—just like you were at a party.

In order to localise whales and dolphins under water, we used metal ears 18" in diameter that were attached to hydrophones. When these ears were placed under water, we were able to accurately localise underwater sounds in 3-D space by listening to the sounds by earphones. We used this system to localise whales and dolphins. Sound travels five times faster under water, so we made the 'pinnae' larger to give the same time-ratio encoding as we find in the air. We also made large plastic ears that were tested in

Vietnam. These ears were of the same proportions as real ears but were much larger. They enabled us to hear distant sounds with a high degree of localisation accuracy in the jungle. It seems that we can adapt to ears of almost any size. The reason we can do this is because sound recognition is based on a time-ratio code.

We were able to reverse the process and could take any sound recording and encode it so that sounds were perceived as coming from specific points in space. Using this technique, we could spread out a recording of an orchestra. The effect added reality as if you were actually listening to a live concert. This information has never been used commercially except in one instance when I allowed The Beach Boys to record one of their albums with my special 'laser' microphones.

We developed a special Neurophone that enabled us to 'hear' dolphin sounds up to 250,000 Hertz. By using the Neurophone as part of the Man-Dolphin communicator, we were able to perceive more of the intricacies of the dolphin language. The human ear is limited to a 16 kHz range, while dolphins generate and hear sounds out to 250 kHz. Our special Neurophone enabled us to hear the full range of dolphin sounds.

As a result of the discovery of the encoding system used by the brain to localise sound in space and also to recognise speech intelligence, we were able to create a digital Neurophone.

When our digital Neurophone patent application was sent to the patent office, the Defense Intelligence Agency slapped it under a secrecy order. I was unable to work on the device or talk about it to anyone for another five years.

This was terribly discouraging. The first patent took 12 years to get, and the second patent application was put under secrecy for five years.

The digital Neurophone converts sound waves into a digital signal that matches the time encoding that is used by the brain. These time signals are used not only in speech recognition but also in spatial recognition for the 3-D sound localisation.

The digital Neurophone is the version that we eventually produced and sold as the Mark XI and the Thinkman Model 50 versions. These Neurophones were especially useful as subliminal learning machines. If we play educational tapes through the Neurophone, the data is very rapidly incorporated into the long-term memory banks of the brain.

HOW DOES IT WORK?

The skin is our largest and most complex organ. In addition to being the first line of defence against infection, the skin is a gigantic liquid crystal brain.

The skin is piezo-electric. When it is vibrated or rubbed, it generates electric signals and scalar waves. Every organ of perception evolved from the skin. When we are embryos, our sensory organs evolved from folds in the skin. Many primitive organisms and animals can see and hear with their skin.

When the Neurophone was originally developed, neurophysiologists considered that the brain was hard-wired and that the various cranial nerves were hard-wired to every sensory system. The eighth cranial nerve is the nerve bundle that runs from the inner ear to the brain. Theoretically, we should only be able to hear with our ears if our sensor organs are hard-wired. Now the concept of a holographic brain has come into being. The holographic brain theory states that the brain uses a holographic encoding system so that the entire brain may be able to function as a multiple-faceted sensory encoding computer. This means that sensory impressions may be encoded so that any part of the brain can recognise input signals according to a special encoding. Theoretically, we should be able to see and hear through multiple channels.

The key to the Neurophone is the stimulation of the nerves of the skin with a digitally encoded signal that carries the same time-ratio encoding that is recognised as sound by any nerve in the body.

All commercial digital speech recognition circuitry is based on so-called dominant frequency power analysis. While speech can be recognised by such a circuit, the truth is that speech encoding is based on time ratios. If the frequency power analysis circuits are not phased properly, they will not work. The intelligence is carried by phase information. The frequency content of the voice gives our voice a certain quality, but frequency does not contain information. All attempts at computer voice recognition and voice generation are only partially successful. Until digital time-ratio encoding is used, our computers will never be able to really talk to us.

The computer that we developed to recognise speech for the Man-Dolphin communicator used time-ratio analysis only. By recognising and using time-ratio encoding, we could transmit clear voice data through extremely narrow bandwidths. In one device, we developed a radio transmitter that had a bandwidth of only 300 Hz while maintaining crystal clear transmission. Since signal-to-noise ratio is based on bandwidth considerations, we were able to transmit clear voice over thousands of miles while using milliwatt power.

Improved signal-processing algorithms are the basis of a new series of Neurophones that are currently under development. These new Neurophones use state-of-the-art digital processing to render sound information much more accurately.

ELECTRONIC TELEPATHY?

The Neurophone is really an electronic telepathy machine. Several tests prove that it bypasses the 8th cranial nerve or hearing nerve and transmits sound directly to the brain. This means that the Neurophone stimulates perception through a 7th or alternate sense.

All hearing aids stimulate tiny bones in the middle ear. Sometimes when the eardrum is damaged, the bones of the inner ear are stimulated by a vibrator that is placed behind the ear on the base of the skull. Bone conduction will even work through the teeth. In order for bone conduction to work, the cochlea or inner ear that connects to the 8th cranial nerve must function. People who are nerve-deaf cannot hear through bone conduction because the nerves in the inner ear are not functional.

A number of nerve-deaf people and people who have had the

entire inner ear removed by surgery have been able to hear with the Neurophone.

If the Neurophone electrodes are placed on the closed eyes or on the face, the sound can be clearly 'heard' as if it were coming from inside the brain. When the electrodes are placed on the face, the sound is perceived through the trigeminal nerve.

We therefore know that the Neurophone can work through the trigeminal or facial nerve. When the facial nerve is deadened by means of anaesthetic injections, we can no longer hear through the face.

In these cases, there is a fine line where the skin on the face is numb. If the electrodes are placed on the numb skin, we cannot hear it but when the electrodes are moved a fraction of an inch over to skin that still has feeling, sound perception is restored.

This proves that the means of sound perception via the Neurophone is by means of skin and not by means of bone conduction.

There was an earlier test performed at Tufts University that was designed by Dr Dwight Wayne Batteau, one of my partners in the US Navy Dolphin Communications Project. This test was known as the "Beat Frequency Test". It is well known that sound waves of two slightly different frequencies create a 'beat' note as the waves interfere with each other. For example, if a sound of 300 Hz and one of 330 Hz are played into one ear at the same time, a beat note of 30 Hz will be perceived. This is a mechanical summation of sound in the bone structure of the inner ear. There is another beat phenomenon known as the binaural beat. In the binaural beat, sounds beat together in the corpus callosum in the centre of the brain. This binaural beat is used by Robert Monroe of the Monroe Institute to stimulate altered states. That is, to entrain the brain into high alpha or theta states.

The Neurophone is a powerful brain-entrainment device. If we [illegible] theta signals directly through the Neurophone, we can entrain any brain state we like. In a future article we will tell how the Neurophone has been used as a subliminal learning device and also as a behaviour modification system.

Batteau's theory was that if we could place the Neurophone electrodes so that the sound was perceived as coming from one side of the head only, and if we played a 300 Hz signal through the Neurophone, if we also played a 330 Hz signal through an ordinary headphone we would get a beat note if the signals were summing in the inner ear bones.

When the test was conducted, we were able to perceive two distinct tones without a beat. This test again proved that Neurophonic hearing was not through the means of bone conduction.

When we used a stereo Neurophone, we were able to get a beat note that is similar to the binaural beat, but the beat is occurring inside the nervous system and is not a result of bone conduction.

The Neurophone is a 'gateway' into altered brain states. Its most powerful use may be in direct communications with the brain centres, thereby bypassing the 'filters' or inner mechanisms that may limit our ability to communicate to the brain.

If we can unlock the secret of direct audio communications to the brain, we can unlock the secret of visual communications. The skin has receptors that can detect vibration, light, temperature, pressure and friction. All we have to do is stimulate the skin with the right signals.

We are continuing Neurophonic research. We have recently developed other modes of Neurophonic transmission. We have also reversed the Neurophone and found that we can detect scalar waves that are generated by the living system. The detection technique is actually very similar to the process used by Dr Hiroshi Motoyama in Japan. Dr Motoyama used capacitor electrodes very much like those we use with the Neurophone to detect energies from the various chakras. ∞

and challenge any side-by-side comparison. [illegible]